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The Mediating Role of Cognitive Flexibility on the Relationship between Cross-Race Interactions and Psychological Well-Being

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THE MEDIATING ROLE OF COGNITIVE FLEXIBILITY ON THE RELATIONSHIP BETWEEN CROSS-RACE INTERACTIONS AND PSYCHOLOGICAL WELL-BEING

DISSERTATION

A dissertation submitted in partial fulfillment of the
requirements for the degree of Doctor of Philosophy in the
College of Education
at the University of Kentucky

By

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ABSTRACT OF DISSERTATION

THE MEDIATING ROLE OF COGNITIVE FLEXIBILITY
ON THE RELATIONSHIP BETWEEN CROSS-RACE
INTERACTIONS AND PSYCHOLOGICAL WELL-BEING

Counseling psychologists are tasked with understanding optimal psychological and cognitive functioning. Recent theoretical predictions (Crisp & Turner, 2011) and growing evidence suggest that cross-race interactions are important ways individuals might improve their cognitive and psychosocial functioning. However, the theoretical predictions from Crisp and Turner have not yet been tested in one model. Further, much of the empirical support for the theoretical predictions has been from studies using 1) undergraduate samples and 2) weak theory-measurement fit.

The present study used an online, community survey (N = 270) to test Crisp and Turner's (2011) predictions that cognitive flexibility would mediate the relationship between cross-race interactions and psychological well-being in both a White sample (N = 198) and a sample of Color (N = 70).

Results supported the hypothesized mediational model, indicating that more frequent cross-race interactions were associated with greater psychological well-being, through greater cognitive flexibility.

The findings are discussed in the context of Crisp and Turner's model (2011). Implications for sociological, educational, and psychological professionals are also discussed. Recommendations for future studies include experimental, longitudinal, and intervention studies with strong theory-measurement fit.

KEYWORDS: Cross-Race Interactions, Cognitive Flexibility, Psychological Well-being, Racial Identity

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Date

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Chapter One: Problem Statement and Theoretical Framework

The United States is becoming increasingly diverse. Racial and ethnic diversity is projected to increase until non-Hispanic White individuals make up less than half the U.S. population by 2060 (United States Census Bureau, 2012). Without a simple majority of any one racial identity group, individuals of all racial identity backgrounds will increasingly engage in cross-race interactions as they go to school, work, or the supermarket. Although extant literature addresses the impact of cross-race interactions on prejudice reduction (reviewed in Pettigrew & Tropp, 2011), Crisp and Turner (2011) theorize that cross-race interactions have important implications for optimal cognitive and psychological functioning. The present study contributes to the literature by testing Crisp and Turner's hypothesis that diversity interactions are related to cognitive and psychological functioning in positive ways.

A central tenet of social theory is *homophily*. Homophily refers to the principle that individuals tend to interact with others who are similar to themselves (Lazarsfeld & Merton, 1954). Given the strides made in diversifying the nation, the workforce, and the education system, homophilic tendencies will be increasingly challenged in the next several decades, with consequences that are yet to be determined. For example, although extant literature addresses the impact of cross-race interactions on prejudice reduction (reviewed in Pettigrew & Tropp, 2011), little research explains empirically the impact of cross-race interactions on developmental and psychosocial outcomes in individuals. The present study is the first to test both cognitive and psychological associations with cross-race interactions in one model.

Understanding how engaging in cross-race interactions may benefit individuals developmentally and psychosocially is consistent with the professional goals and values of counseling psychology and will contribute to the existing social science literature. Practically, understanding the individual benefits of diversity interactions may motivate the generation of more effective psychoeducational and organizational interventions to enhance personal growth, development, and well-being.

Theoretical Frameworks

The present study tested a model that draws on theories of cognitive adaptations to diversity interactions (Crisp & Turner, 2011) and psychological well-being (Ryff, 1989) to elucidate hypothesized cognitive and psychological benefits of diversity interactions.

Cognitive adaptations to diversity interactions. Crisp and Turner (2011) proposed the model of cognitive adaptation to experiences of social and cultural diversity. Their model uses four parts to explain the conditions and processes that govern the translation of cross-race interactions into cognitive flexibility by way of cognitive adaptation. The first part, categorization condition, requires that the experience of social and cognitive diversity involves more than one social category, and that these categories are inconsistent (e.g., Black and Professor). Next, in the processing condition, if the perceiver is motivated and able to engage in a process known as inconsistency resolution, they will arrive at a more individual impression of the target. Third, the adaptation process posits that repeated exposure to the previous two conditions results in cognitive adaptations related to generative thought. Generative thought is "reconstruing the target with individualized emergent attributes" that "are attributes ascribed to category

combinations that are independent of attributes associated with either of the constituents" (p. 249). In other words, individuals are able to consider both previous knowledge and new information to understand the target more fully. Finally, the generalization process posits that cognitive adaptation related to cross-race interactions is generalized to other domains related to judgment, resulting in generalized cognitive flexibility.

Adaptation. An important distinction must be made in the study of cross-race interactions and their impact on cognitive flexibility: adaptation depends on whether there are multiple, frequent cross-race interactions. When only a single exposure occurs, the individuals may create a subtype, rather than experience lasting cognitive changes. A subtype is a minor restructuring of categorical perceptions, which is temporary and limited in its impact on cognitive style. However, with repeated exposure to cross-race interactions meeting the conditions of the model, cognitive adaptations occur in which inconsistency resolution becomes automated. Since inconsistency resolution is cognitively laborious when executed consciously, automating the process frees up cognitive resources for generative thought. It is the automation of inconsistency resolution and the added cognitive capital afforded generative thought that is indicative of cognitive flexibility in the domain of cross-race interactions.

Generalization. Generalization in Crisp and Turner's model (2011) predicts that the cognitive flexibility described in the adaptation part is generalized to domains of judgment not necessarily related to cross-race interactions. That is, generative thought can be facilitated in other domains by the suppression of other forms of prescribed information. For example, someone who has automated the suppression component of inconsistency resolution may generate more career options, because they are able to

practice cognitive flexibility with inconsistencies between their goals of making a living wage, having time for family, and finding a sense of purpose in their work. The task at hand is similar in structure, and therefore may benefit from a similar strategy to reconcile the inherent inconsistencies. The generalization of the cognitive adaptation from inconsistency resolution to other forms of categorical inconsistencies is called cognitive flexibility and is the primary outcome predicted by the Crisp and Turner's model.

Well-being. According to Crisp and Turner (2011), diversity interactions also impact psychological well-being:

> The experience of social and cultural diversity may therefore not only help encourage greater egalitarianism in social attitudes and behavior, but also have broader significance for the psychological well-being of individuals, groups, organizations, and social and political systems. (p. 242-243)

Well-being as a positive indicator of psychological functioning is a rather recent construct in the psychological literature. Prior to Diener's work (1984), well-being was often discussed in the psychological literature as an absence of or lower severity of distress or mental illness. In order to capture a more complete indication of psychological functioning, Diener proposed a new concept called Subjective Well-Being (SWB), comprised of three facets, positive affect, negative affect, and life satisfaction (1984). Positive and negative affect refers to the frequency, duration, and intensity of positive and negative emotions, respectively. Life satisfaction refers to a cognitive assessment of overall satisfaction with life. According to Diener, each of these dimensions contribute to the global assessment of SWB by incorporating both affective and cognitive experiences. A major contribution of SWB is the idea that positive affect

and negative affect are not polar opposites of the same dimension. Rather, an individual can experience both a high degree of positive affect and negative affect simultaneously. Therefore, SWB is indicated by a high degree of positive affect and life satisfaction and a low degree of negative affect. Even with these contributions, human psychological development is complex, and SWB considers only two domains of psychological experiences: affect and cognition.

In order to describe positive identity development, a new concept was developed by Waterman and colleagues that integrated the concept of Eudaimonia into identity development theory to describe Eudaimonic Well-Being (EWB; Waterman, Schwartz, Zamboanga, Ravert, Williams, Agocha, & ... Donnellan, 2010). Eudaimonia was first described by Aristotle as a separate form of happiness above and beyond hedonia, or affect. Eudaimonic well-being is related to a sense of purpose and personal growth and is theorized to result from positive identity development. The major contribution of EWB to the understanding of well-being is that an individual's well-being is related to both developmental and existential psychological functioning.

Arguing that the previous concepts of well-being, SWB and EWB, were not sufficiently grounded in the full range of psychological theory, Ryff (1989) set out to construct a concept that considered points of agreement between several psychological theories regarding individual well-being (i.e., Allport, 1961; Buhler, 1935; Buhler & Massarik, 1968; Erikson, 1959; Jahoda 1958; Jung, 1933; Maslow, 1968; Neugarten, 1968, 1973; Rogers, 1961; Von Franz, 1964). In her review of several psychological theories, Ryff concluded that they often spoke of similar characteristics of well-being. "These points of convergence in the prior theories constitute the core dimensions of the

alternative formulation of psychological well-being pursued in this research (Ryff, 1989; p. 1070-1071)." She arrived at six theoretically-based dimensions of well-being: *self-acceptance*, *positive relations with others*, *autonomy*, *environmental mastery*, *purpose in life*, and *personal growth.* Of note, these dimensions theoretically overlap with EWB, especially the purpose in life and personal growth dimensions. Additionally, psychological well-being's individual, interpersonal, developmental, and existential factors are all theorized to result in the affective and cognitive indicators of SWB. Indeed, the correlation between each of these concepts has been demonstrated (Ryff, 1989; Waterman et al., 2010).

Present Study

The present study addresses the core values of Counseling Psychology proposed by Packard (2009) in important ways. First, counseling psychology is "committed to respectful treatment for all, inherent human dignity, inclusion rather exclusion, and accepting and celebrating cultural and individual diversity" (p. 622). Thus, the profession is inextricably tied to inclusion as a professional value. However, the "synergistic integration of science and practice is essential to our work and includes use of various methods of inquiry" (p. 622). Thus, it is important to support recommendations related to diversity and inclusion with empirical investigation. The present study tests the relation between cross-race interactions and optimal psychological and cognitive functioning. The present study has potential implications for understanding the benefits of greater inclusion in the contexts of work, education, and psychology. Second, many arguments for increasing cross-race interactions rest on justice and improving the lives of individuals from marginalized backgrounds. However,

framing cross-race interactions as a way to increase one's cognitive flexibility and psychological well-being may be more in line with the professional value of "positive relationships" necessary in "stimulating change." That is, counseling psychologists may enlist support more effectively from individuals from majority backgrounds if they communicate benefits related to more diverse workplaces, rather than simply highlighting the injustices inherent in discriminatory hiring practices and other forms of systemic and structural discrimination and exclusion. Third, in line with professional values, the present study recognizes the developmental pitfalls of homophily and may promote "healthy development" (p. 622) by highlighting the potential for growth if one is willing to engage in more cross-race interactions. The next chapter will review the literature published so far on associations between cross-group interactions, cognitive development, and psychological well-being.

Chapter Two: Literature Review

Cross-Race Interactions and Psychological Well-Being

Published empirical studies of Crisp & Turner's prediction that cross-race interactions result in psychological well-being is piecemeal, at most. Therefore, I broadened the scope of the literature review to include studies that met the following criteria (see Table 2.1). First, I included published studies that included any assessment of individuals' contact with information about people from different social identities were included. These studies of diversity variables assessed cross-race interactions (Bowman, 2013a; Bowman, 2013b; Chang et al., 2006): number of diversity courses (Bowman, 2010a), interactions with diverse students (Bowman, 2013a), cross-orientation best-friendship (Baiocco et al., 2014), and cross-gender best-friendship (Baiocco et al., 2014). Second, I only included studies that included an assessment of how well individuals were functioning psychologically. As shown in Table 2.1, psychological outcomes included PWB (Bowman, 2010a; Bowman, 2013a): a well-being questionnaire (Baiocco et al., 2014), college satisfaction (Bowman, 2013b), and self-confidence (Chang et al., 2006). Using the criteria above, I located three studies that tested the relation between cross-race interaction and any psychological outcome (Bowman, 2013a; Bowman, 2013b; Chang et al., 2006). Only one study to date has examined the relation between cross-race interactions and psychological well-being (e.g., Bowman, 2013a). Further, only two studies have examined any diversity variable and psychological well-being (Bowman, 2010a; Bowman, 2013a).

Outside of psychological literature, higher education literature has elucidated relationships between diversity variables and college satisfaction (Bowman, 2013b), self-

confidence (Chang et al., 2006), and well-being (Bowman 2010a; Bowman 2013a; Baiocco et al., 2014). For example, in a sample of 19,667 undergraduate students, higher frequency of cross-race interaction was related to self-confidence (Chang et al., 2006). These findings lend support to Crisp and Turner's prediction, but their outcome measure relates to only one aspect of psychological well-being, self-acceptance. A longitudinal study of 3,081 undergraduate students utilized Ryff's (1989) measure of all six dimensions of psychological well-being and found that diversity coursework improved well-being (Bowman, 2010a). These findings also support Crisp and Turner's prediction, but more compelling evidence would need to measure cross-group interaction rather than coursework.

One such study is a longitudinal investigation by Bowman (2013a), who found a relationship between cross-race interactions and psychological well-being across two waves of data in a college sample (N = 8615). In this study, psychological well-being increased over time with more diversity interactions. Not only does this study lend empirical support for the CPAG model's (Crisp & Turner, 2011) predictive power for psychological well-being, it also suggests that repeated and frequent interaction may be necessary to experience the benefits of diversity interactions.

Racial minority experiences. A potential caveat in the study of psychological well-being related to cross-race interaction is that these interactions occur in the social context of privilege and oppression. In the United States, People of Color, or those who identify or are identified as non-White, experience systematic prejudice and discrimination in their interpersonal interactions, in institutions, and in society. Thus, it is possible that greater cross-race interaction for People of Color may mean more

exposure to prejudice and discrimination, leading to decreased psychological well-being. In addition People of Color may have less agency in whether they engage in cross-race interactions due to institutional racism that creates barriers to access with consequences related to frequency cross-race interactions. For example, in the educational context, People of Color seeking higher education must often choose to attend a historically Black college or university (HBCU) or a predominately White institution (PWI). Their decision has implications for their opportunity for cross-race interactions. Overall, People of Color who live and work in PWIs may have little choice in the frequency of their cross-race interactions. The prejudice and discrimination experienced in and the lack of agency associated with cross-race interactions for People of Color likely has important implications for their psychological well-being.

Although the rates of cross-race interaction are largely unknown for People of Color, the impact of these interactions on psychological well-being seem to be consistent with Crisp and Turner's (2001) predictions. Bowman (2010a) found an effect of diversity courses on well-being for People of Color, although White students experienced greater gains in their psychological well-being related to one course. However, the Bowman (2013a) study found that students of color reported a stronger effect of cross-race and cross-group interactions on psychological well-being compared to White students. In the Bowman (2013b) study, participants of Color experienced greater gains in college satisfaction with greater cross-race interactions. Overall, the evidence suggests that Crisp and Turner's (2011) predictions apply to racial minority populations.

Diversity Interactions and Cognitive Flexibility

Crisp and Turner's (2011) prediction that cross-race interactions result in cognitive flexibility has a growing base of empirical support in the literature. According to Dennis and Vander Wal (2010), cognitive flexibility is "the ability to switch cognitive sets to adapt to changing environmental stimuli [and] appears to be the core component for most operational definitions of cognitive flexibility" (p. 242). Table 2.1 demonstrates that no study has looked specifically at cross-race interactions and cognitive flexibility in the same study. Thus the review was expanded to studies examining the relation between diversity variables and cognitive variables. Recall that diversity variables were any variable that exposed individuals to frequent contact with information about people from different social identities and included, in addition to cross-race interactions (reviewed in Bowman, 2010b; Bowman, 2013a; Change et al., 2006; Hurtado, 2001): study abroad experiences (Lee, Therriault, & Linderholm, 2012), diversity coursework (reviewed in Bowman, 2010b), diversity coursework (reviewed in Bowman, 2010b), and cross-group interactions (reviewed in Bowman, 2010b). Cognitive variables were any variable that indicated adaptive thinking styles. The cognitive variables examined to date include cognitive development, intellectual engagement, complex thinking, critical thinking, and problem-solving (Bowman, 2010b; Bowman, 2013a; Chang et al., 2006; Gurin et al., 2002; Hurtado, 2001).

For example, a meta-analysis of 17 such studies found that diversity variables were consistently related to cognitive variables (N = 77,029; Bowman, 2010b). Additionally, the meta-analysis compared various forms of diversity experiences like diversity courses, workshops, cross-race interactions, and other cross-group interactions

to find the strongest effects on cognitive variables. Cross-race interaction produced larger effects on cognitive variables compared to other diversity experiences. Cognitive variables in the meta-analysis were grouped into cognitive tendencies (disposition toward complex thinking and attributional complexity) and cognitive skills (critical thinking skills and problem solving skills). Cognitive tendency outcomes are most strongly related to the construct of cognitive flexibility and were associated with stronger effect sizes than cognitive skills. These findings suggest a link between cross-race interactions and cognitive flexibility. However, the studies reviewed in Bowman's (2010b) meta-analysis were all correlational, preventing interpretation of causality.

More compelling evidence of Crisp and Turner's model comes from a surprise finding in an experimental study of 135 undergraduate students (Lee et al., 2012). The study utilized two measures of divergent thinking, the Abbreviated Torrance Test for Adults (ATTA; Goff & Torrance, 2002) and the Cultural Creativity Task (CTT; Lee, Theriault, & Linderholm, 2012). Divergent thinking is the use of cognitive flexibility in a given domain, like cultural interactions. The ATTA consists of three activities that elicit responses consistent with divergent thinking that are later scored by the researcher. The CTT was adapted from the ATTA in order to measure divergent thinking in the context of culturally relevant information. In other words, ATTA measured generalized cognitive flexibility, while CCT measured divergent thinking in the context of cross-group interactions. The authors hypothesized an effect of Study Abroad (SA) on culture-specific divergent thinking (CTT), but not domain-general divergent thinking (ATTA). They based these predictions on a domain-specific conceptualization of creativity, though they also reviewed literature supporting the conceptualization of creativity that is

domain-general. The study used two control groups, Planned to Study Abroad (PSA) and No Plan to Study Abroad (NPSA). As the authors predicted, SA participants demonstrated higher divergent thinking skills on the CTT compared to students in both controls. Contrary to the authors' predictions, SA students also exhibited greater cognitive flexibility, as measured by the ATTA, when compared to NPSA students. Additionally, the increase in cognitive flexibility for SA students compared to the PSA students approached significance (p = .08). The effect size for differences between SA and both NPSA and PSA was medium (Cohen's d = .50, in both comparisons). In the case of CTT and ATTA scores, students did not differ between the two control groups, indicating that higher cognitive flexibility did not precede the intent to study abroad. These findings support several predictions by Crisp and Turner (2011). First, the impact of SA on CTT demonstrates the impact diversity interactions have on divergent thinking, as predicted in the processing portion of their model. Further, the impact of SA on ATTA lends support to Crisp and Turner's adaptation process that predicts that repeated cross-group interactions result in the translation of domain-specific divergent thinking into generalized cognitive flexibility. Finally, the null findings for differences between PSA and NPSA support the causational direction, that diversity interactions lead to increased cognitive flexibility.

Cognitive Flexibility and Psychological Well-Being

An important part of Crisp and Turner's (2011) prediction is that the cognitive benefits gained through cross-race interactions impact psychological well-being. As Table 2.1 demonstrates, no studies to date have examined the relationship between cognitive flexibility and psychological well-being in the same study. Therefore, the

review was expanded to include psychological variables, as defined in a previous section. Whereas only two studies examined the relationship between cognitive flexibility and a psychological variable (Brewster et al., 2013; Koesten, Schrodt, & Ford, 2009), the review was expanded to include studies examining divergent thinking (Chermahini & Hommel, 2012; Zambianchi & Bitti, 2014). In much of the cognitive psychology literature, cognitive flexibility is often referred to as divergent thinking, especially in experimental studies. If cognitive flexibility is a cognitive strategy, divergent thinking tasks require participants to demonstrate this strategy in a controlled setting.

Cognitive flexibility and divergent thinking are associated with improved mood (Chermahini & Hommel, 2012), positive therapy outcomes (Johnco, Wuthrich, & Rapee, 2014), successful coping with stress and trauma (Yehuda, Flory, Southwick, & Charney, 2006), and well-being (Koesten et al., 2009; Zambianchi & Bitti, 2014). Important in the study of well-being, Koesten and colleagues surveyed 395 college students and found that cognitive flexibility was significantly related to young adult well-being. Well-being outcomes were self-esteem, physical health status, and fewer symptoms of mental health disorder. In line with Crisp and Turner's assertions, cognitive flexibility was significantly related to all three measures of well-being with a large effect size (β = .65).

Additionally, a study of 232 undergraduate students in Italy reported significant bivariate relationships between divergent thinking and several areas of functioning including social well-being, regulation of negative emotions, expression of positive emotions, and three forms of coping: proactive, reflective, and preventive (Zambianchi & Bitti, 2014). Divergent thinking was not associated with social well-being when all independent variables were included in their linear model. However, this finding is not

surprising given the high correlation between divergent thinking and seven of the nine other independent variables. At the bivariate level, divergent thinking had a medium-sized effect on social well-being (r = .32). Their findings are consistent with Crisp and Turner's assertion that cognitive flexibility may contribute to positive relations with others, a domain of well-being.

In the domain of subjective well-being, Chermahini and Hommel (2012) have demonstrated that divergent thinking improves mood, using an experimental design. The researchers randomly assigned 84 Dutch university students to four conditions based on the type of task they would either prepare for or complete. Participants in the divergent thinking group (DT) completed the Alternate Use Task (AUT; Guilford, 1967), and participants in the convergent thinking group (CT) completed the Remote Associates Test (Mednick, Mednick & Mednick, 1964). Those in the preparation control groups (pDT and pCT) only prepared to complete their respective task. Only the flexibility score of the AUT was used in the study. Mood was measured using a unidimensional measure in which higher scores were related to more positive mood. Chermahini and Hommel found that the divergent thinking task improved mood, while the convergent thinking task decreased mood. The pre-post differences between the divergent/convergent thinking groups explained 30% of the variance in reported mood (η^2 = .30). The effect size was more than double Cohen's (1988) threshold for a large effect size in the social sciences (η^2 > .14).

The reviewed literature demonstrates the medium to large effect of cognitive flexibility on a range of well-being outcomes. A major limitation of this literature is the almost exclusive use of university and college samples.

Present Study

The present study was designed to test the associations among cross-race interactions, cognitive flexibility, and psychological well-being according to Crisp and Turner's (2011) theoretical model. Evidence for the theorized pathways is growing, but limited by poor theory-measurement fit, and almost exclusively college samples (See Table 2.1 for a summary). The present study was designed to address many of these limitations. First, the present study is the first to test all three of these variables in one, cross-sectional model, allowing the hypothesized indirect pathway from cross-race interactions to psychological well-being through cognitive flexibility to be examined. Second, the present study included a measure of well-being that has theoretical foundations in several domains of psychological functioning, which is a better fit with Crisp and Turner's (2011) predictions than measures used in previous studies. Third, a lack of consensus exists in how to measure cross-group interactions in the well-being literature, such that only three studies examine cross-race interactions each with a different measure. The present study used a measure of cross-race interactions, given the previous metaanalytic finding that cross-race interactions has the most powerful relationship with cognitive variables (Bowman, 2010b). Fourth, since cross-race interactions occur in the context of privilege and oppression based on racial identity, the present study extends previous findings by examining Crisp and Turner's predictions in participants in both majority and minority racial identity groups.

Hypotheses. The proposed study will test the following hypotheses:

1. Cross-race interactions will be positively correlated with psychological well-being.

2. Cognitive flexibility will be positively correlated with psychological well-being.
3. Cognitive flexibility will mediate the relationship between cross-race interactions and psychological well-being.

Since previous research addressing differences by racial identity in these processes is limited, the following hypothesis is stated as a research question:

4. Does racial identity moderate the relationships in Hypotheses 1-3?

Table 2.1.

Summary of previous findings on diversity interactions, cognitive benefits, and psychological benefits.

Study	*N*	Diversity	Cognitive	Psychological	Effect Size		Methodology
Bowman, 2010a	3,801	# of Diversity Courses	---	RSPW[x]	β = .10	S	Longitudinal; College Sample
Bowman, 2013a	8,615	Diversity Interactions[c]	---	RSPW[x]	β = .06	S	Longitudinal; College Sample
Baiocco et al., 2014	1,100	Cross-Orientation Best-Friendship (Dichotomous)	---	W-BQ12[h]	η^2 = .04	S	Survey; Community/Italian Sample
Baiocco et al., 2014	1,100	Cross-Gender Best-Friendship (Dichotomous)	---	W-BQ12[h]	η^2 = .05	S	Survey; Italian Community Sample
Bowman, 2013b	3,098	Cross-Race Interactions	---	College Satisfaction (new scale)	β = .04		Survey; College Sample
Chang et al., 2006	19,667	Frequency of Cross-Race Interactions (new scale)	---	Self-Confidence (new scale)	β = .04	S	Survey; College Sample
Lee et al., 2012	135	Study Abroad	ATTA	---	*d* = .50	M	Experimental; College Sample
Bowman, 2010b	77,029	Diversity Experiences[a]	Cognitive Development[b]	---	$\overline{ES}$ = 0.05	S	Meta-analysis; College Samples
Bowman, 2013a	8,615	Frequency of Diversity Interactions (new scale)	Need for Cognition Scale[d]	---	β = .07	S	Longitudinal; College Sample

Table 2.1 (Continued).

Summary of previous findings on diversity interactions, cognitive benefits, and psychological benefits.

Study	*N*	Diversity	Cognitive	Psychological	Effect Size		Methodology
Chang et al., 2006	19,667	Frequency of Cross-Race Interactions (new scale)	Cognitive Development (new scale)	---	β = .05	S	Survey; College Sample
Gurin et al., 2002	1,582	Interactional Diversity[c] (new scale)	Active Thinking (new scale)	---	β = .10	S	Survey; College Sample
Hurtado, 2001	4,250	Cross-Race Interactions[g] (single item)	Critical Thinking (Single Item)	---	β = .10	S	Survey; College Sample
Hurtado, 2001	4,250	Cross-Race Interactions[g] (single item)	Problem Solving (Single Item)	---	β = .08	S	Survey; College Sample
Chermahini & Hommel, 2012	84	---	Divergent Thinking[i]	Mood Inventory[j]	η^2 = .30	L	Experimental; College Sample
Brewster et al., 2013	411	---	Cognitive Flexibility[k]	Composite SWLS and RSES[l]	β = .51	L	Survey; Online Community Sample
Koesten et al., 2009	395	---	Cognitive Flexibility[k]	Composite RSES, GHQ-12, and Physical Health[m]	β = .65	L	Survey; College Sample

Table 2.1 (Continued).

Summary of previous findings on diversity interactions, cognitive benefits, and psychological benefits.

Study	*N*	Diversity	Cognitive	Psychological	Effect Size		Methodology
Zambianchi & Bitti, 2014	232	---	Divergent Thinking[n]	Social Well-Being[o]	r = .32	M	Survey; College Sample

Notes. S = Small, M = Moderate, L = Large.
[a], Meta-analysis included studies with various measures of cross-group interactions, diversity coursework, and diversity workshops.
[b], Meta-analysis included studies with various measures of cognitive skills.
[c], Measure of both frequency and quality of diversity interactions.
[d], Need for Cognition Scale (NCS; Cacioppo et al., 1996).
[g], "Studied with someone from a different racial/ethnic background."
[h], Well-Being Questionnaire Short-Form (W-BQ12; Riazi et al., 2006).
[i], Alternative Uses Task (AUT; Guilford, 1967).
[j], Phillips, Bull, Adams, and Fraser, 2002.
[k], Cognitive Flexibility Scale (CFS; Martin & Rubin, 1995).
[l], Composite scale using Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985) and the Rosenberge Self-Esteem Scale (RSES; Rosenberg, 1965).
[m], Composite scale using the Rosenberge Self-Esteem Scale (RSES; Rosenberg, 1965), Well-being questionnaire short-form (W-BQ12; Riazi et al., 2006), and the Short Form-12 (SF-12v2; Ware, Kosinski, & Keller, 1996; Ware, Kosinski, Turner-Bowker, & Gandek, 2002).
[n], APSP; Pastorelli et al., 2001.
[o], Social Well-Being Scale (Keyes, 1998).
[p], Abbreviated Torrance Test for Adults (ATTA; Goff & Torrance, 2002).
[x], Ryff Scales of Psychological Well-Being, 54-item version (RSPW; Ryff 1989; Ryff & Keyes, 1995).

Chapter Three: Method

Participants

Participants were 270 individuals over the age of 18 (M = 29.58, SD = 11.29). Participants identified as female (73%), male (25%), and 2% used gender-expansive labels. Racial identity, sexual identity, and country of origin distributions for the sample are found in Table 3.1. Level of education and household income distributions for the sample are found in Table 3.2.

Measures

Racial identity group. Participants were asked to identify their racial identity (Appendix A). These responses were used to examine the two racial identity comparison groups of interest (Participants of Color and White Participants). Descriptives are reported for both groups in Table 3.3.

Psychological well-being. The Ryff Scales of Psychological Well-Being (PWB; Ryff, 1989) were chosen due to its assessment of well-being across several dimensions. Given that cognitive flexibility is posited by the CPAG model (Crisp & Turner, 2011) to be generalized to other domains of functioning, the PWB was used as an inclusive measure indicating psychological well-being across domains of functioning. Total psychological well-being scores served as the dependent variable. The PWB was used to gather participant responses related to six dimensions of psychological well-being: self-acceptance, positive relations with others, autonomy, environmental mastery, purpose in life, and personal growth (See Appendix B). The full PWB has 14 items for each dimension, for a total of 84 Likert-type items with responses ranging from 1 (*Strongly Disagree*) to 6 (*Strongly Agree*). The present study used 7 items per dimension for a total

of 42 items in order to prevent participant attrition. This 42 item version was included in the second wave of the Midlife in the United States (MIDUS) survey and has been used in several studies using the MIDUS dataset (e.g., Costanzo, Ryff, & Singer, 2009; Morozink, Friedman, Coe, & Ryff, 2010). In the total MIDUS-II sample (N = 4015), Cronbach alphas on the subscales ranged from .70 to .84. Once reverse-scored items were computed, item responses were summed for the psychological well-being score. Total scores in the present study ranged from 72 to 230 with higher scores indicating better overall well-being. The mean score for the present sample was 171.43 (*SD* = 31.47). In previous studies, Cronbach's alphas for the 84-item measure have ranged from .81 to .88 (Ryff, 1989). Cronbach's alpha for the present study was .94. Summary statistics for the PWB are reported in Table 3.4.

Cross-race interactions. In order to measure the frequency of cross-race interaction, Clément's (1986) Frequency of Contact with Francophones scale was adapted to measure interactions with members of different racial identities (See Appendix C). The scale used a 7-point Likert scale ranging from *Not at all frequent* to *Extremely frequent*. The scale had 7 items inquiring about contact in several domains, like family, friends, and in day-to-day life. Higher scores indicated greater frequency of cross-race interactions. In previous studies, Cronbach's alphas for the frequency scale ranged from .72 to .73 (Clément & Noels, 1992). In the present study, Cronbach's alphas for the adapted scale was.78. Results from an exploratory factor analysis are reported in Table 3.5. Overall, no factor loadings for any items on any of the subscales were lower than .45. Summary statistics for each scale are reported in Table 3.4. In the published literature, this scale has been limited to use as a measure of cross-group interaction

between Anglophones and Francophones in Ottawa, Canada. In the present study, frequency scores were used to measure the frequency of cross-race interactions (FCRI). These frequency scores were used as independent variables in the analyses.

Cognitive flexibility. The Cognitive Flexibility Inventory (CFI; Dennis & Vander Wal, 2010) is a 20-item Likert-style scale designed to measure the ability to generate alternatives. Item responses are rated from 1 (*Strongly Disagree*) to 7 (*Strongly Agree*). A sample item is "I try to think about things from another person's point of view." Total scores range from 66 to 138 with higher scores indicating greater cognitive flexibility (Appendix D). Cronbach's alpha was .91, and test-retest reliability was good (r = .81, $p < .001$) in the original study. The CFI has two subscales: Alternatives and Control. The control subscale measures "the tendency to perceive difficult situations as controllable" (p. 250). The alternatives subscale measures "the ability to perceive multiple alternative explanations for life occurrences and human behavior," and "the ability to generate multiple alternative solutions to difficult situations" (p. 250). Factor loadings in the original study ranged from .45 to .84. Cronbach's alpha was .90 in the present study. Summary statistics for the CFI are reported in Table 3.4. Cognitive flexibility scores were used as the mediator.

Demographic controls. Other demographic items included age and education and were used as control variables (Appendix A; reported in Tables 3.1 and 3.2).

Procedures

Announcements were sent out to online listservs, forums, and groups targeting the general population as well as People of Color. Announcements included a link to the survey and language encouraging readers to take the survey and to forward the

announcement to others who may be interested. Once participants finished the survey, they were returned to the announcement so they could share it on social media or other websites. In order to oversample participants of Color, separate announcements were distributed designed to invite participants over the age of 18 a) without specifying racial identity, and b) specifically inviting participants of Color (See Appendices E and F, respectively). The general invitation was distributed widely, while the racial identity-specific invitations were distributed on websites and forums related to racial identity. Study data were collected and managed using REDCap electronic data capture tools hosted at the University of Kentucky.* REDCap (Research Electronic Data Capture) is a secure, web-based application designed to support data capture for research studies, providing: 1) an intuitive interface for validated data entry; 2) audit trails for tracking data manipulation and export procedures; 3) automated export procedures for seamless data downloads to common statistical packages; and 4) procedures for importing data from external sources. Participants accepted informed consent before answering demographic questions. Next, participants answered scales outlined in the measures section, followed by an opportunity to leave comments for the researchers. Once the survey was completed, participants were thanked for their participation. Finally, study participants were redirected to the research study website where they had the opportunity to invite friends to participate in the study. Pilot participants reportedly took approximately 20 minutes to complete the full online survey.

Data Analysis Plan

Missing data analyses. Schlomer and colleagues' (2010) process for addressing missing data were used to guide how missing data were handled in the present study.

First, data were visually inspected to determine if any patterns or explanations for missing data could be discerned. Next, Little's MCAR test was used to test whether data were missing completely at random (MCAR). For those scales that were not MCAR, dummy variables were created to indicate whether a case contained missing items in these scales (0 = completed all items, 1 = contained missing data). The relationship between these dummy variables and demographic information were tested to determine whether items are missing at random (MAR).

Next, cases in which data were missing for 20% or more of any one scale were removed from further analysis. This threshold was used by Denton and colleagues (2014). Next, missing items from the remaining cases were imputed using expectation-maximization (EM; Dempster, Laird, & Rubin, 1977) in SPSS 22.

Preliminary analyses. The ranges, means, standard deviations, medians, standard error of the mean, and Cronbach's alphas were computed for all study variables. One of the assumptions of linear regression modeling is that data were normally distributed. Preliminary analyses tested these assumptions by examining skewness and kurtosis. A macro designed by Garcia-Granero (2002) was used to perform the Breusch-Pagan and Koenker test for heteroscedasticity. When variables in the model were not homoscedastic (equal variance across groups), control variables were added to the model in order to improve the variables' homoscedasticity.

Hypothesis testing. Linear regression modeling in SPSS 22 was used to test the mediational model according to Baron and Kenny's (1986) first three steps. However, the fourth step was modified according to recommendations by Tofighi and Thoemmes (2014). Given the effect of age, racial identity, and education on the variables of interest

in the present study, these were used as control variables in the testing of hypotheses 1-3. To test hypothesis 4, age and education were used as control variables, and dichotomous race (POC and White) was used to compare the two models.

Hypothesis 1. In accordance with the first step in Baron and Kenny's (1986) process for mediational models, linear regression models tested the relationship between frequency of cross-race interactions and psychological well-being. If the *p*-value was lower than .05, the null hypothesis would be rejected, and the first hypothesis would be accepted.

Hypothesis 2. Next, linear regression models tested the relationship between cognitive flexibility and psychological well-being, controlling for cross-race interactions. If the *p*-value was lower than .05, the null hypothesis would be rejected, and the second hypothesis would be accepted.

Hypothesis 3. In order to test hypothesis 3, Baron and Kenny's (1986) third step and computation of the z_{Sobel} statistic would determine whether criteria for mediation were met. In step 3, linear regression models tested the relationship between cross-race interactions and cognitive flexibility. If the *p*-value was lower than .05, the instructions by Tofighi and Thoemmes (2014) were used to calculate z_{Sobel} and confidence intervals for the product of the coefficients to test for indirect effects. They provide an online calculator at http://www.amp.gatech.edu/RMediation that allows researchers to input the product of the coefficients and estimated standard error from the regression analysis to create confidence intervals. In the proposed study, if the .95 confidence intervals (i.e., $p < .05$) for the indirect effect of cross-race interactions through cognitive flexibility did not contain 0, hypothesis 3 would be accepted.

Hypotheses 4. In order to test hypothesis 4, the steps outlined for testing hypotheses 1 through 3 were repeated for each racial identity comparison group: POC and White. A change in significance for any of the steps outlined in the previous section would indicate that membership in the specified group (i.e., POC and White) moderates the model, such that the mediational model no longer describes the process for that group.

Table 3.1.

Demographic characteristics of participants (N = 270).

	n	%
Gender (*n* = 264)		
Male	66	24
Female	193	72
Gender Expansive	5	2
Missing	6	2
Sexual Identity (*n* = 269)		
Gay/Lesbian	44	16
Mostly Gay/Lesbian	17	6
Bisexual	50	19
Mostly Straight	22	8
Straight	136	50
Missing	1	< 1
Race/Ethnicity (*n* = 269)		
Black/African American	14	5
Asian	16	6
Native Hawaiian/Pacific Islander	-	-
Latino/a	10	4
White/Caucasian	198	73
> 1	21	8
Other	9	3
Missing	1	< 1
Country of Origin (*n* = 212)		
United States	165	61
International	47	17
Missing	58	21.5

Table 3.2.

Socioeconomic status indicators for participants

Socioeconomic Status Indicator	*n*	%
Education Level Completed (*n* = 270)		
No formal education	-	-
Some primary education	2	1
Primary education	4	2
Some secondary education	10	4
Secondary education	14	5
Some college or technical school	73	27
College or technical school	71	26
Some graduate or professional school	25	9
Graduate or professional school	71	26
Income (*n* = 262)		
Under $10,000	34	13
$10,000 to $19,999	35	13
$20,000 to $29,999	42	16
$30,000 to $39,999	20	7
$40,000 to $49,999	22	8
$50,000 to $59,999	17	6
$60,000 to $74,999	24	9
$75,000 to $84,999	5	2
$85,000 to $99,999	11	4
$100,000 to $149,999	33	12
$150,000 to $199,999	10	4
$200,000 to $249,999	2	1
$250,000 and above	7	3
Missing	8	3

Table 3.3.

Sample size for each comparison group.

	N	%
People of Color	70	26.1
White	198	73.9
Total	268	100

Table 3.4.

Summary Statistics for Inferential Assumptions Characteristics.

		Range		Distribution		Central Tendency		Dispersion	
Variable	*N*	Min	Max	Kurt.	Skew.	Med.	*M*	*SD*	SEM
FCRI	270	7	49	-0.38	-0.07	28.00	27.61	8.94	0.54
CFI	270	66	138	-0.46	-0.32	108.00	106.24	16.02	0.97
PWB	270	72	230	-0.16	-0.44	174.00	171.43	31.47	1.92

Note. FCRI = Frequency of Cross-Race Interactions. CFI = Cognitive Flexibility. PWB = Psychological Well-Being.

Table 3.5.

Factor loadings and scale statistics for the frequency of Cross-Race Interactions scale.

	Race
Item Factor Loadings	
In my family	0.46
In my intimate relations	0.63
In my neighborhood	0.64
Among my friends	0.79
Among people with whom I have regular social contact at work or school	0.75
Among people at the businesses I frequent	0.72
In my religious community	0.60
Scale Statistics	
Cronbach's α	0.78
Mean	27.61
SD	8.94

Notes. Scale total range 7-49. Item range (1) not at all frequently to (7) extremely frequently. See scale administration example in Appendix C.

Chapter Four: Analyses and Results

Preliminary Analyses

Missing data. First, data were visually inspected to determine if any patterns or explanations for missing data could be discerned. No discernable pattern was found, except that many participants stopped taking the survey after the demographics page (n = 87). Little's MCAR test indicated that data were MCAR for cross-race ($\chi^2(29) = 38.97$, p = .10) interactions, but not for the PWB ($\chi^2(1051) = 1223.19$, $p < .001$) and the CFI ($\chi^2(219) = 311.36$, $p < .001$). However, the MAR test indicated that PWB and CFI were not related to age (PWB: $F(1,419) = .181$, $p = .67$; CFI: $F(1,419) = .312$, $p = .58$), country of origin (PWB: $\chi^2(1) = .71$, $p = .40$; CFI: $\chi^2(1) = .08$, $p = .78$), gender (PWB: $\chi^2(2) = 1.04$, $p = .60$; CFI: $\chi^2(2) = 4.14$, $p = .13$), education (PWB: $\chi^2(8) = 8.83$, $p = .36$; CFI: $\chi^2(8) = 10.11$, $p = .26$), income (PWB: $\chi^2(12) = 10.33$, $p = .59$; CFI: $\chi^2(12) = 11.90$, $p = .45$), sexual identity (PWB: $\chi^2(4) = 8.58$, $p = .07$; CFI: $\chi^2(4) = 6.14$, $p = .19$), or racial identity (PWB: $\chi^2(6) = 5.89$, $p = .44$; CFI: $\chi^2(6) = 4.27$, $p = .64$). Thus, missing items in the PWB and the CFI were MAR.

Next, cases in which data were missing for 20% or more of any one scale (n = 305) were removed from further analysis. Of those missing data, 236 exited the survey without answering any scale items. As a result of this threshold, the final sample size was 270.

Evaluation of inferential assumptions. One of the assumptions of linear regression is that data were normally distributed. To test this assumption, data were analyzed as indicated in Table 3.4. Field (2009) suggests a formula to calculate a z-score for kurtosis and skewness by dividing the score by its standard error. However, they

suggest this method is counter indicated for sample sizes over 200, because the standard error becomes smaller and normally distributed data can be misidentified as problematic. Instead, skewness and kurtosis statistics greater than one were examined visually to confirm whether they were approximately normally distributed. The dependent and moderating variables (PWB and CFI, respectively) were approximately normally distributed. Overall, the normality assumption of the linear regression analysis was met. A macro designed by Garcia-Granero (2002) was used to perform the Breusch-Pagan and Koenker test for heteroscedasticity. When variables in the model are not homoscedastic (equal variance across groups), control variables may be added to the model in order to improve the variables' homoscedasticity. While frequency of cross-race interactions was not significantly heteroscedastic, CFI was significantly heteroscedastic until age was included as a control (Table 4.1). As a result, age was controlled for in the linear regression models used for hypothesis testing.

Descriptive statistics and bivariate relations. Summary statistics for frequency of cross-race interactions, CFI, and PWB are reported in Table 3.4. Frequency of cross-race interaction scores ranged from 7 to 49 and were acceptably distributed (Kurtosis = -0.38; Skewness = -0.07). Measures of central tendency for frequency of cross-race interaction scores were similar (M = 27.61, Median = 28.00), and dispersion was acceptable (SD = 8.94, SEM = 0.54). CFI scores ranged from 66 to 138, were acceptably distributed (Kurtosis = -0.46; Skewness = -0.32), had sufficiently similar central tendency measurements (M = 106.24, Median = 108.00), and had acceptable dispersion (SD = 16.02, SEM = 0.97). PWB scores ranged from 72 to 230, were acceptably distributed (Kurtosis = -0.16; Skewness = -0.44), had sufficiently similar central tendency

measurements (M = 171.43, Median = 174.00), and had acceptable dispersion (SD = 31.47, SEM = 1.92). A correlation matrix using bivariate Pearson r analysis was computed and is reported for all variables treated as continuous (Table 4.2). Frequency of cross-race interaction—the independent variable in the study—was significantly, positively correlated with both the mediating variable (CFI, r = .28, p < .001) and the dependent variable (PWB, r = .33, p < .001). However, frequency of cross-race interaction was not significantly correlated with any continuous demographic variable (i.e., age, education, and income). CFI is the mediating variable in the study and was significantly, positively correlated with the dependent variable (PWB, r = .72, p < .001). CFI was also positively correlated with all three continuous demographic variables, including age (r = .27, p < .001), education (r = .33, p < .001), and income (r, = .14, p < .05). In addition to the previously reported relationships with the independent and mediating variables, PWB was also positively correlated with age (r = .24, p < .001) and education (r = .40, p < .001). However, PWB was not significantly correlated with income. All three continuous demographic variables were positively correlated (age and education: r = .33, p < .001; age and income: r = .16, p < .01; education and income: r = .13, p < .05).

ANOVAs. One-way Analysis of Variance was executed with each of the measures—frequency of cross-race interaction, CFI, and PWB—in the model as dependent variables and each of the nominal—gender and racial identity—variables as factors. No main effect for gender was found on any of the three variables of interest: frequency of cross-race interactions (F(2, 261) = 1.54, p = .217), CFI (F(2, 261) = .218, p = .804) or PWB (F(2, 261) = .06, p = .947).

Racial identity. There was a main effect for Racial Identity on cross-race interactions, $F(5, 262) = 8.49$, $p < .001$, such that White participants reported lower frequency of cross-race interaction compared to their Black, Asian, and Multiracial peers. A main effect of Racial Identity on CFI was detected ($F(5, 262) = 2.36$, $p < .05$), but a Tukey post-hoc analysis did not detect significant mean differences between racial identity groups. No main effect of racial identity on PWB was detected ($F(5, 262) = .97$, $p = .435$). Means and Tukey HSD results are reported in Table 4.3.

Hypothesis Testing

Control variables. Given the relationship between age and all three variables in the study—cross-race interactions, cognitive flexibility, and psychological well-being—age was entered into subsequent linear regression models as a control variable. Given the relationship between education level and both cognitive flexibility and psychological well-being, education level was entered into subsequent linear regression models as a control variable. Other demographic variables (i.e., gender, sexual identity, income level, and country of origin) were not entered as control variables, as these variables were not significantly associated with any of the study variables.

Hypothesis 1. In accordance with the first step in Baron and Kenny's (1986) linear regression analysis tested the relationship between frequency of cross-race interaction and psychological well-being. In the full sample, frequency of cross-race interaction ($\beta = .30$, $p < .001$) was positively associated with psychological well-being, such that greater frequency of cross-race interactions was correlated with higher psychological well-being. Results of this first step are also reported in Figure 1 and Table 4.4.

Hypothesis 2. In step 2, linear regression tested the relationship between cognitive flexibility and psychological well-being while controlling for cross-race interactions. Cognitive flexibility was positively related to psychological well-being when controlling for cross-race interactions ($\beta = .63$, $p < .001$), such that higher scores on the CFI were associated with higher scores on the PWB. Results of this second step are also reported in Figure 1 and Table 4.4.

Hypothesis 3. In step 3, linear regression tested the relationship between cross-race interactions and cognitive flexibility. In the full sample, cross-race interaction significantly was positively related cognitive flexibility ($\beta = .28$, $p < .001$), such that greater frequency of cross-race interactions was associated with higher scores on the CFI. Results of this third step are also reported in Figure 1 and Table 4.4.

Confidence intervals for the product of the coefficients to test for indirect effects were computed using the online calculator at http://www.amp.gatech.edu/RMediation. The products of the coefficients and the z_{sobel} statistic are reported in Figure 1. The Sobel test statistic was significant, indicating an indirect relationship between cross-race interactions and psychological well-being *through* cognitive flexibility ($\alpha\beta = .18$, $z_{Sobel} = 4.35$, $p < .001$). Overall, mediation was supported according to Tofighi and Thoemmes's (2014) criteria. Since the relationship between cross-race interaction and psychological well-being continued to be statistically significant after controlling for cognitive flexibility, partial mediation was supported, according to Baron and Kenny's (1986) criteria. Linear regression results for all models testing hypotheses 1-3 are reported in Figure 1 and Table 4.4.

Hypothesis 4. Results pertaining to hypothesis 4 are reported in Figure 2 and in Tables 4.5 and 4.6. Results support hypotheses 1-3 and the mediational model in both the POC and White comparison groups. First, cross-race interactions were positively related to psychological well-being in both the POC (β = .38, p < .001) and White (β = .26, p < .001) comparison groups. Second, cognitive flexibility was positively correlated with psychological well-being in both the POC (β = .52, p < .001) and the White (β = .63, p < .001) comparison groups. Third, cross-race interactions were positively correlated with cognitive flexibility in both the POC (β = .35, p < .001) and the White (β = .24, p < .001) comparison groups. Finally, the indirect relationship between cross-race interactions and psychological well-being through cognitive flexibility were significant in both the POC ($\alpha\beta$ = .18, z_{sobel} = 2.91, p < .01) and the White ($\alpha\beta$ = .15, z_{sobel} = 3.42, p < .001) comparison groups. In order to reject the null hypothesis that race does not moderate the relationship between the variables of interest, differential findings needed to be found such that a relationship between study variables was significant in one group, but not the other. Findings do not support the hypothesis that race moderates the mediational relationship between the variables of interest: frequency of cross-race interaction, CFI and PWB.

Post-Hoc Analyses

Given the cross-sectional nature of the study design and the inherent limits to conclusions related to causality, post-hoc analyses tested the incremental contribution of frequency of cross-race interaction to psychological well-being beyond the variance accounted for by cognitive flexibility. Table 4.7 shows that cross-race interaction continues to contribute a significant portion to the variance in psychological well-being

(β = .13, p < .01). Additionally, no significant race X FCRI interaction was detected for psychological well-being (β = .12, p = .508). Overall, results suggest that frequency of cross-race interactions are related to psychological well-being above and beyond the contribution of cognitive flexibility, and that these results do not support the alternative hypothesis that minority vs. majority race moderates the association between frequency of cross-race interaction and psychological well-being.

Table 4.1.

Breusch-Pagan test for Heteroscedasticity (Outcome Variable: Psychological Well-Being).

	IV	+Age
FCRI	.017	
CFI	4.094*	4.733

Note. * $p < .05$. ** $p < .01$. *** $p < .001$. FCRI = Frequency of Cross-Race Interactions. CFI = Cognitive Flexibility Inventory.

Table 4.2.

Correlation matrix for continuous variables in the study (N = 270).

		1	2	3	4	5	6
1	Age	---	.33***	.16**	.03	.27***	.24***
2	Education		---	.13*	.10	.33***	.40***
3	Income			---	.02	.14*	.09
4	FCRI				---	.28***	.33***
5	CFI					---	.72***
6	PWB						---

Notes. * $p < .05$. ** $p < .01$. *** $p < .001$. FCRI = Frequency of Cross-Race Interactions. CFI = Cognitive Flexibility Index. PWB = Ryff Scales of Psychological Well-Being.

Table 4.3.

Means, standard deviations, and Tukey HSD results for the main effect of racial identity on cross-race interactions, cognitive flexibility inventory, and psychological well-being scores.

		FCRI		CFI		PWB	
	N	*M*	*SD*	*M*	*SD*	*M*	*SD*
Gender							
Women	193	27.37	8.62	105.97	16.19	172.12	32.51
Men	66	28.05	9.92	107.34	15.95	170.73	28.11
Gender Expansive	5	34.28	6.35	108.40	17.18	170.04	43.60
Racial Identity							
White/Caucasian	198	25.67[abc]	8.42	106.68	15.87	172.37	30.72
Black/African American	14	34.03[a]	7.44	110.57	13.25	178.51	25.12
Asian	16	33.20[b]	7.97	107.77	16.38	171.49	28.64
Latino/a	10	31.68	8.82	95.10	14.22	161.97	34.44
Other	9	32.03	7.23	94.11	15.11	153.18	27.08
Multi	21	33.63[c]	7.99	107.93	17.78	170.82	41.46

Notes. [a-c], indicate significant mean differences according to Tukey HSD post-hoc analysis. FCRI = Frequency of Cross-Race Interaction. CFI = Cognitive Flexibility Inventory. PWB = Psychological Well-Being.

Table 4.4.

Results of linear regression analysis testing hypotheses 1-3 for cross-race interactions.

	PWB			CFI	
	1	2	3	1	2
Controls					
Age	.09	.09	-.01	.16**	.16**
Education	.38***	.35***	-.20***	.27***	.23***
Income	.02	.02	-.02	.07	.06
White/Caucasian	Reference Group				
Black/African American	.05	-.01	-.01	.07	.01
Asian	.01	-.06	-.04	.03	-.03
Latino/a	-.05	-.09	.01	-.11*	-.15**
Other	-.05	-.09	.00	-.11	-.15**
Multi	-.02	-.10	-.07	.02	-.05
Independent Variable					
Cross-Race Interactions		.30***	.13**		.28***
Mediating Variable					
Cognitive Flexibility Inventory			.63***		
R^2	.19	.26	.56	.18	.24
F	7.34***	10.03***	32.09***	6.83***	8.92***

Notes. * p < .05. ** p < .01. *** p < .001. PWB = Psychological Well-Being. CFI = Cognitive Flexibility Inventory.

Table 4.5.

Results of linear regression analysis testing hypotheses 4, POC sample only. (N = 70)

	PWB			CFI	
	1	2	3	1	2
Controls					
Age	.27*	.31**	.18*	.21	.24*
Education	.40***	.35***	.20*	.34**	.30**
Income	.07	.11	.04	.09	.13
Independent Variable					
Cross-Race Interactions		.38***	.19*		.35**
Mediating Variable					
Cognitive Flexibility Inventory			.52***		
R^2	.31	.45	.63	.22	.34
F	9.71***	13.06***	21.40***	6.07**	8.25***

Notes. * $p < .05$. ** $p < .01$. *** $p < .001$. PWB = Psychological Well-Being. CFI = Cognitive Flexibility Inventory.

Table 4.6.

Results of linear regression analysis testing hypotheses 4, White sample only. (N = 198)

	PWB			CFI	
	1	2	3	1	2
Controls					
Age	.05	.05	-.05	.16*	.16*
Education	.36***	.32***	.19***	.23**	.20**
Income	.02	.01	-.04	.08	.07
Independent Variable					
Cross-Race Interactions		.26***	.11*		.24***
Mediating Variable					
Cognitive Flexibility Inventory			.63***		
R^2	.15	.21	.54	.12	.18
F	10.68***	12.64***	44.49***	8.64***	10.08***

Notes. * $p < .05$. ** $p < .01$. *** $p < .001$. PWB = Psychological Well-Being. CFI = Cognitive Flexibility Inventory.

Table 4.7.

Results of post-hoc linear regression analysis testing alternative hypotheses 1 and 2.

	PWB			
	1	2	3	4
Controls				
Age	.09	-.01	-.01	-.01
Education	.38***	.21***	-.20***	.20***
Income	.02	-.02	-.02	-.02
White/Caucasian	Reference Group			
Black/African American	.05	.01	-.01	-.07
Asian	.01	-.02	-.04	-.10
Latino/a	-.05	.03	.01	-.04
Other	-.05	.03	.00	-.04
Multi	-.02	-.04	-.07	-.14
Independent Variable				
Cognitive Flexibility Inventory		.66***	.63***	.63***
Mediating Variable				
Cross-Race Interaction			.13**	.11*
Interaction Term				
POC X Cross-Race Interaction				.12
R^2	.19	.55	.56	.56
F	7.34***	34.05***	32.09***	29.15***

Notes. * $p < .05$. ** $p < .01$. *** $p < .001$. PWB = Psychological Well-Being. POC = Participants of Color.

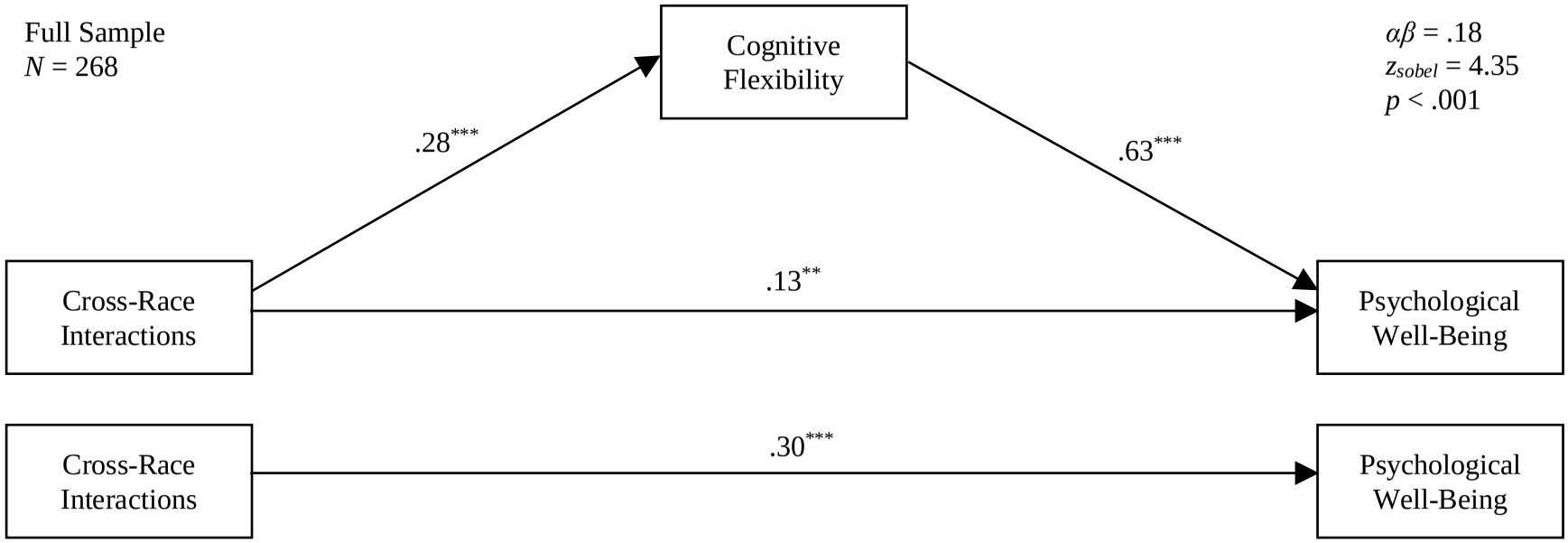

Figure 1. Mediational model in the full sample.

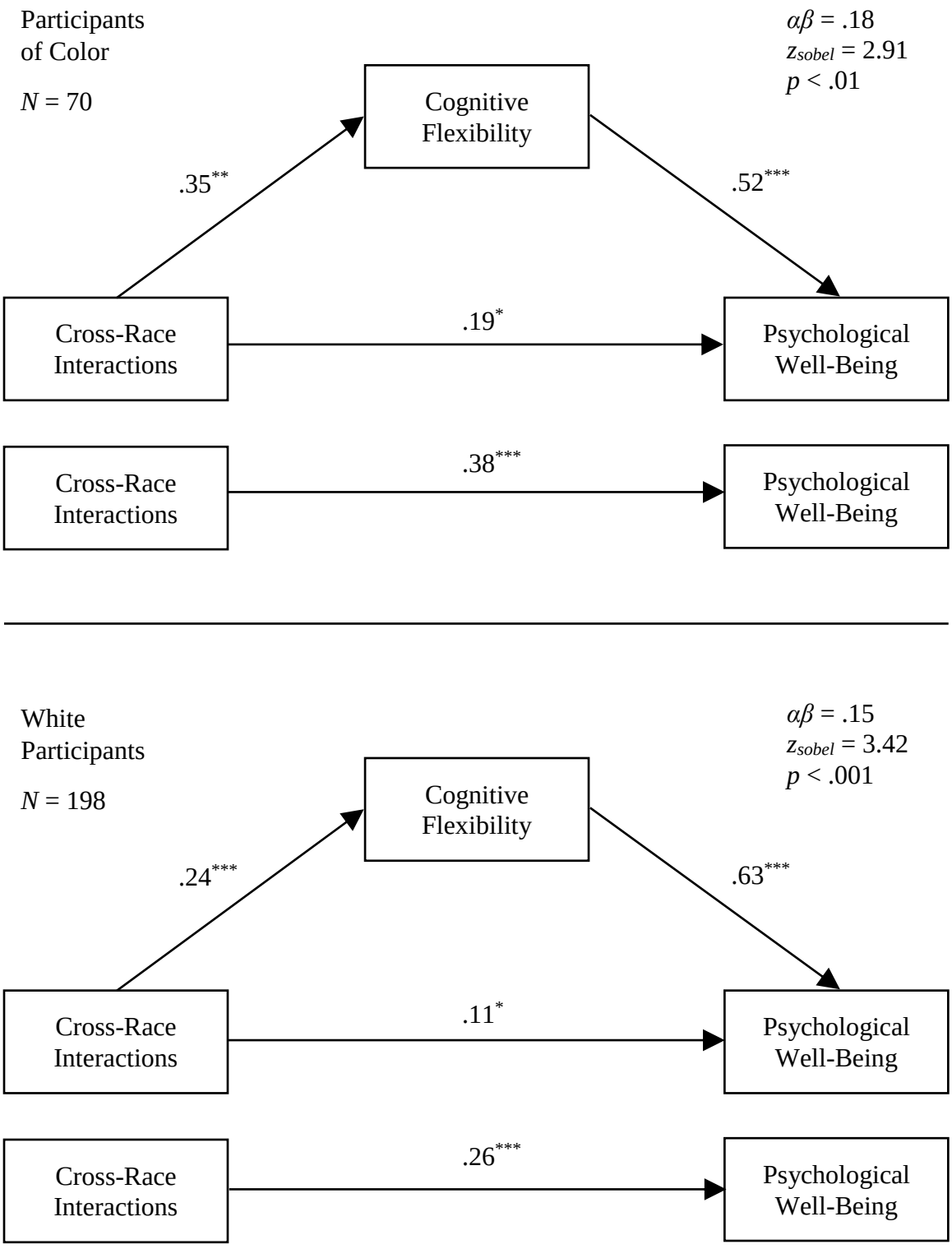

Figure 2. Mediational models by Racial Identity Comparison Groups.

Chapter Five: Discussion

Counseling psychologists are tasked with improving well-being and cognitive development in clients, and making recommendations for policies that foster these resources in organizations and societies. Findings from the present study suggest that encouraging cross-race interactions may be related to increased well-being and cognitive flexibility. The present study is the first to examine in a nationally recruited sample Crisp and Turner's (2011) prediction that more frequent interaction with individuals from different racial identity backgrounds is related to greater cognitive flexibility and psychological well-being. Importantly, these findings are consistent across racial majority and minority identities.

Review of Findings

Cross-race interactions and psychological well-being. Findings in the present study supported the first hypothesis that cross-race interactions would be associated with psychological well-being, such that frequency of cross-race interactions was positively related to psychological well-being. These findings are consistent with Crisp and Turner's (2011) predictions and previous published studies (see Table 2.1; Baiocco et al., 2014; Bowman, 2010a; Bowman, 2013a; Bowman, 2013b; Chang et al., 2006). Of note, previous studies (summarized in Table 2.1) consistently found small effects of diversity interactions on psychological well-being. However, cross-race interactions in the present study were associated with psychological well-being with a moderate effect size. This discrepancy may be related to theory-measurement fit. For example, of the studies that examined cross-race interactions (see Table 2.1), both used domain-specific measures of well-being: College Satisfaction (Bowman, 2013b) and Self-Confidence (Change et al.,

2006). Crisp and Turner's theoretical predictions relate to a more global impact on psychological well-being. The present study utilized PWB (Ryff, 1989) due to the strength of the fit between the theoretical predictions and the global assessment of psychological well-being across several domains.

The positive relationship between cross-race interactions and psychological well-being was demonstrated in participants who identified as POC and White. Testing the relationship between cross-race interactions and psychological well-being in a diverse sample is important because these interactions occur in the context of privileged and oppressed racial identities. While Crisp and Turner (2011) theorize that frequent cross-race interactions will be related to greater psychological well-being, their theory does not account for how minority racial identities may experience these cross-race interactions. Importantly, if the quality of these interactions is negative, one might expect that frequent cross-race interactions may decrease psychological well-being in racial minorities. While the present study is unable to rule out all negative impacts of cross-race interactions for racial minorities, findings suggest that there are important benefits to psychological well-being in both racial minority and majority groups.

Cognitive flexibility and psychological well-being. As predicted in hypothesis 2, cognitive flexibility was strongly related to psychological well-being in the present study. These findings are consistent with previous findings with large effect sizes for the relationship between cognitive flexibility and psychological well-being (reviewed in Table 2.1; Brewster et al., 2013; Chermahini & Hommel, 2012; Koesten et al., 2009; Zambianchi & Bitti, 2014). From a cognitive behavioral perspective (Beck, 2012), affective, behavioral, and physiological reactions to situations are preceded by cognitive

reactions that are based on previous assumptions, attitudes, and beliefs. Cognitive flexibility is an important goal of cognitive behavioral therapy because it is thought to allow individuals to react to stressors or crises in their lives in a more adaptive way, resulting in psychological well-being. The present study supports this theoretical assumption, that cognitive flexibility is adaptive.

Important in the validation of Crisp and Turner's (2011) model in minority populations, cognitive flexibility was related to psychological well-being in both racial identity comparison groups. This is important because the hypothesized benefits do not address power differentials and their possible impact on choice or opportunity in the frequency of cross-race interactions. It is reasonable to question whether cognitive flexibility is similarly related to psychological well-being when individuals from minority backgrounds do not get to choose who they interact with.

Cross-race interactions and cognitive flexibility. Consistent with hypothesis 3, frequency of cross-race interaction was associated with cognitive flexibility in the present study. These findings are consistent with previous studies, which found a similar relationship between diversity interactions and cognitive outcomes (See Table 2.1; Bowman, 2010b; Bowman, 2013a; Change et al., 2006; Gurin et al., 2002; Hurtado, 2001; Lee et al., 2012). Although most previous studies detected a small effect of diversity experiences on cognitive outcomes, the present study detected a moderate effect size. One notable exception to this trend in the literature is the study by Lee and colleagues (2012) that found a moderate effect of study abroad experiences on cognitive flexibility using an experimental design. Their moderate effect size was likely due to the strength of their methodology. Important to measurement-theory fit, the present study

and the study by Lee and colleagues (2012) were the only studies to examine cognitive flexibility as the outcome of interest. Other studies reviewed in Table 2.1 measured other cognitive outcomes, some more related to cognitive flexibility than others. The difference in measurement-theory fit may explain the discrepancy in effect sizes.

Mediational findings. The present study found that cognitive flexibility mediated the relationship between frequency of cross-race interactions and psychological well-being. These findings support Crisp and Turner's (2011) theoretical predictions that greater frequency of cross-race interactions is related to higher psychological well-being by increasing cognitive flexibility. An important limitation is the cross-sectional design in the current study. Still, evidence is mounting that that the causal directions are as predicted by Crisp and Turner (e.g., Lee et al., 2012). Combined with the literature on which the theory is based, the present study adds support for the cognitive and psychological benefits of cross-race interaction.

Impact of racial identity on findings. The present study tested the mediational model outlined above in both a POC and White sample. An important feminist criticism of psychological research is that many theories are normed on White participants. This is problematic because cross-race interactions may have different impacts for majority vs. minority participants due to systemic and structural racism. In order to engage in more inclusive research practices, the present study examined whether differences in the mediational model differed between POC and White samples. Overall, all relationships between the variables of interest—frequency of cross-race interaction, cognitive flexibility, and psychological well-being—were significant in both samples. These

findings suggest that Crisp and Turner's (2011) predictions are applicable to both racial minority and majority populations.

Implications for Future Research and Practice

The present study has important implications in psychology and education. As discussed previously, homophily is a central tenet of sociological theory and posits that individuals seek out social interaction with similar others. While this is seen as the norm in the sociological literature, the present study supports Crisp and Turner's (2011) theorized psychological benefits to resisting homophilic tendencies and engaging in cross-race interaction. Thus, the natural tendency to seek out similar others may not be the healthiest social strategy for individuals.

Implications for social justice advocacy. Much of the literature on cross-group interaction has been related to prejudice reduction. However, Gonzalez, Riggle, and Rostosky (2015) review literature suggesting that reducing prejudice does not increase positive attitudes and feelings toward members of minority identity groups. Prejudice reduction strategies—if not supplemented by positive narratives—tell a story that casts majority members in the role of hero or villain and minority members in the role of victim. The redemption story in prejudice reduction strategies cast majority members as villains due to their stereotyping and discriminatory behavior until they become heroes by rescuing minority members by deconstructing systemic oppression. While this narrative may be helpful in motivating many to reduce negative stereotypes, it begins the process of attitude change with a "well-meaning pity" (Adichie, 2009) toward members of minority identities. Gonzalez and colleagues observe "Positive information and stories may reinforce positive narratives about intergroup relationships while disrupting habits of

relying on negative narratives" (p. 376, Gonzalez, Riggle, & Rostosky, 2015). Rewriting the prejudice reduction narrative to include the benefits of cross-race interaction casts individuals from all racial identities as individuals with something to offer. Important in social justice advocacy, improving social climate is empirically related to greater positive attitudes, but not less negative attitudes (Pittinsky, Rosenthal, & Montoya, 2011). Therefore, cross-race interaction may benefit social climate more if the benefits are shared, rather than just the injuries inflicted by racial segregation. Relaying the benefits may be more likely to result in positive attitudes. Further, the benefits of cross-race interaction are common across racial identities, resulting in a common goal. Common goals may encourage more positive attitudes as well. Crisp and Turner's (2011) predictions and findings in the present study point out the win-win nature of diversity interactions, that members of both majority and minority racial identities may experience benefits related to optimal psychosocial and cognitive functioning. Including these benefits with information about privilege and oppression may be an important intervention in fostering more positive attitudes and improving social climate in organizations.

Implications for psychological practice. Psychologists are tasked with improving the psychological well-being of individuals at a variety of levels. In group interventions, for example, therapists often highlight group similarities in order to build group cohesion. However, findings from the present study and Crisp and Turner's (2011) model suggest interacting with individuals from other racial identity groups has important benefits for cognitive flexibility and psychological well-being. Thus, group therapists

may find benefits related to recruiting more racially diverse groups and allowing differences in racial identity to be made visible in group through discussion.

Findings may also prompt some I/O psychologists to recommend interventions aimed at increasing racial diversity in the organizations they work with. Cognitive flexibility may have important implications for productivity. For example, a study of 419 Taiwanese manufacturing workers found that individuals with greater cognitive flexibility were less resistant to organizational changes (Su, Chung, & Su, 2012). Managers likely benefit from a cognitively flexible workforce because they are more adaptable to changing organizational climates. As cross-race interaction is related to cognitive flexibility, managers may be advised by I/O psychologists to recruit a more diverse workforce in order to develop a more flexible workforce. In addition to the implications of a more cognitively flexible workforce, Wright and Cropanzano (2004) review a comprehensive literature linking psychological well-being to job performance. Overall, a psychologically well workforce is a productive one.

Implications for education. Educational institutions have begun to see the value in diversity in students, faculty, and staff, but few studies have tested whether educational outcomes are improved when students engage more frequent cross-race interactions. Much of the rationale related to encouraging more diverse institutions relates to justice and theoretical benefits to critical thinking. While justice as a value should be enough to create more inclusive institutions, it is important to understand the cognitive and psychological implications of more inclusive institutions, with presumably more frequent cross-race interactions. The present study found that cognitive flexibility and psychological well-being were indeed related to cross-race interactions. However, it was

also important to understand whether these benefits were evident for both privileged and oppressed identity groups, namely related to racial identity. For example, although an institution may intend to benefit students of color by creating more inclusive campuses, previous research does not speak to how more frequent cross-race interactions impact the cognitive and psychosocial functioning of students of color. Thus, although the intention of policies encouraging diversity on campuses may be to promote justice, the impact may actually be creating greater injustice. While the present study does not address negative impacts to students of color attending PWIs, the findings suggest more frequent cross-race interactions are related to cognitive flexibility and psychological well-being for racial minority groups, in addition to racial majority groups. Together with previous studies, the present study supports more racially diverse learning environments.

Strengths and Limitations

Strengths. The present study contributes to the well-being literature by testing the relationship between psychological well-being and two theoretically related variables: cross-race interactions and cognitive flexibility. The theoretical foundation (Crisp & Turner, 2011) for the present study makes the findings particularly important in the well-being literature in three important ways. The following section highlights that previous studies have not examined cognitive flexibility's theorized mediating role in the relationship between frequency of cross-race interaction and psychological well-being. The next section reviews the variety of measures that are often related, but not specifically designed to test Crisp and Turner's theoretical predictions. In the third section, a review highlights that previous studies used almost exclusively undergraduate samples.

Theoretical framework. First, the present study addresses previous limitations by testing all three theorized relationships (i.e., between cross-race interactions and psychological well-being, cross-race interactions and cognitive flexibility, and cognitive flexibility and psychological well-being) in one model. Previous studies have provided piecemeal support by examining associations between (a) experiences of diversity and cognitive outcomes (Bowman, 2010b; Bowman 2013a; Change et al., 2006; Gurin et al., 2002; Hurtado, 2001; Lee et al., 2012), (b) experiences of diversity and psychological well-being (Baiocco et al., 2014; Bowman, 2010a; Bowman, 2013a; Bowman, 2013b; Chang et al., 2006), and (c) cognitive flexibility and psychological outcomes (Brewster et al., 2013; Chermahini & Hommel, 2012; Koesten et al., 2009; Zambianchi & Bitti, 2014). However, none of these studies examine all three pieces of Crisp and Turner's theoretical prediction: that cross-race interaction is related to psychological well-being through cognitive flexibility. Filling this need in the literature was the primary purpose of the present study.

Measurement. The present study was designed with Crisp and Turner's theoretical model at the foundation of measurement selection. The theory-measurement fit in the studies reviewed in Table 2.1 has been problematic in testing Crisp and Turner's theoretical predictions. For example, only four studies examined cross-race interactions (Bowman, 2013a; and Bowman, 2013b; Change et al., 2006; Hurtado, 2001). Only one of these studies tested the relationship between cross-race interaction and a global measure of psychological well-being, specifically the Ryff's PWB measure (Bowman, 2013a). None of these examined a measure of cognitive flexibility. Rather, cognitive outcomes included a scale of cognitive development (Chang et al., 2006), critical

thinking (Hurtado, 2001), and problem solving (Hurtado, 2001). Crisp and Turner predicted that cognitive flexibility is related to general psychological well-being across domains of functioning. However, previous studies of cognitive flexibility and divergent thinking were examined in relation to domain-specific measures of well-being like mood (Chermahini & Hommel, 2012), satisfaction with life (Brewster et al., 2013), self-esteem (Brewster et al., 2013; Koesten et al., 2009), general health (Koesten et al., 2009), and social well-being (Zambianchi & Bitti, 2014). The present study was designed to address previous limitations in the literature by adapting a measure of cross-race interaction (adapted from Clément, 1986), a measure of cognitive flexibility (Dennis & Vander Wal, 2010), and a domain-general measure of psychological well-being (Ryff, 1989).

Samples. The present study examined the relationship between cognitive flexibility and psychological well-being in an online, community sample. Other studies examining the variables of interest (reviewed in Table 2.1) were limited to undergraduate samples, rendering the findings not generalizable to the general population. Findings in the study sample of adults across the lifespan support Crisp and Turner's theoretical model and its possible relevance to the general population (see limitations). Further, the present sample included individuals who ranged in education from *some primary education* to *graduate or professional school*. The median education level was *college or technical school*, meaning most participants had completed college or technical school. While the survey did not ask whether participants were currently enrolled in school, only individuals who endorsed some college or technical school would potentially currently be enrolled. In our sample of 270 participants, only 73 participants endorsed this level of education, meaning that 197 participants (73%) completed less (i.e., some primary

education, primary education, or some secondary education) or more (college or technical school, some graduate or professional school, or graduate or professional school) education and were outside of the undergraduate educational context. The present study demonstrated that recruiting educationally and generationally diverse samples is particularly important in studying the variables of interest. For example, education was significantly related to both cognitive flexibility and psychological well-being in the present study, and age was correlated with both cognitive flexibility and psychological well-being. Age and education were moderately correlated as well.

Limitations. In addition to the previously outlined strengths, there are several limitations. First, the present study used an online sample, and internal validity cannot be ensured due to lack of control over the environment in which participants took the survey. Additionally, sampling bias may have been introduced by the web-based methodology, as participants without access to the internet would have been prevented from participating. The participants were from a wide range of ages (18 to 71), but almost half were between the ages of 18 and 25. Although efforts were made to recruit a racially diverse participants, 73% of participants identified as White or Caucasian. The racial identity distribution of White participants is higher than the U.S. Census Bureau's (2012) estimates of *White alone, not Hispanic or Latino* individuals (63.7%).

Finally, Crisp and Turner's (2011) predictions imply causal directions that the cross-sectional design of the present study could not confirm. Post-hoc analyses tested an alternative model to determine whether cross-race interaction continued to explain a significant portion of the variance in psychological well-being after controlling for cognitive flexibility. The present findings confirmed the amount of variance explained

by cross-race interactions was significant. Therefore, even if causal direction is between cross-race interaction and cognitive flexibility is not supported by future studies, it remains an important factor in psychological well-being. Still, previous studies using experimental and longitudinal designs support the direction of causation predicted by Crisp and Turner (2011), such that diversity interactions lead to cognitive flexibility, which lead to greater psychological well-being (Bowman, 2010a; Bowman, 2013a, Chermahini & Hommel, 2012; Lee et al., 2012).

Future Research

The present study utilized a cross-sectional design to test the relationships predicted by Crisp and Turner (2011) related to frequency of cross-race interaction, cognitive flexibility, and psychological well-being. Future studies could examine these relationships using experimental and longitudinal designs to provide stronger evidence for the causality presumed by Crisp and Turner's theoretical model. Additionally, the present study lays the groundwork for more theoretically-driven measurement of the variables of interest. Future research seeking to test or confirm Crisp and Turner's predictions must be intentional in their selection of measures with strong psychometric properties and strong theory-measurement fit. For example, in the study of cross-race interactions, for example, being able to explicate the contribution frequency vs. quality of cross-race interaction may help elucidate important caveats in Crisp and Turner's (2011) model. Finally, much of the research is related to understanding cross-race interactions that are already occurring. Intervention studies aimed at increasing cross-race interactions and other cross-group interactions and testing their impact on cognitive flexibility and psychological well-being will provide the strongest evidence for Crisp and

Turner's model, as well as guide professional best practices in psychology, education, and public policy.

Conclusions

The present study has expanded the understanding of well-being by testing its theorized relationships with both cross-race interactions and cognitive flexibility. These findings support the continued study of these important topics, with the aim of understanding how to optimize individual, organizational, and societal functioning. The findings further support the predictive power of Crisp and Turner's (2011) model. While these findings are not conclusive, they suggest individuals may be able to optimize their own functioning by engaging in more frequent cross-race interactions.

Appendix A:

Demographics Questionnaire

1. Age: _____
2. Where do you live? (Country) _____
3. Sex: _____
4. What is your highest level of education?
   - No formal education
   - Some primary education
   - Primary education
   - Some secondary education
   - Secondary education
   - Some college or technical school
   - College or technical school
   - Some graduate or professional school
   - Graduate or professional school
5. What is your household income?
   - Under $10,000
   - $10,000 to $19,999
   - $20,000 to $29,999
   - $30,000 to $39,999
   - $40,000 to $49,999
   - $50,000 to $59,999
   - $60,000 to $74,999
   - $75,000 to $84,999
   - $85,000 to $99,999
   - $100,000 to $149,999
   - $150,000 to $199,999
   - $200,000 to $249,999
   - $250,000 and above
6. Using the following categories, please select the category that best describes your sexual identity. You will be able to say more in the following question if you wish to clarify.
   - Straight
   - Mostly Straight
   - Bisexual
   - Mostly Gay/Lesbian
   - Gay/Lesbian

7. Please describe your sexual identity (e.g., gay, lesbian, bisexual, straight). You may use as many words as necessary.

   _____

8. Please choose the racial identity(ies) that best describe how you identify yourself. You will be able to say more in the following question if you wish to clarify.
   - White/Caucasian
   - Black/African American
   - American Indian or Alaska Native
   - Asian
   - Native Hawaiian/Pacific Islander
   - Latino/a
   - Other

9. Please describe your racial identity. You may use as many words as necessary.

   _____

Appendix B:

Ryff Scales of Psychological Well-Being

Instructions: The following set of questions deals with how you feel about yourself and your life. Please remember that there are no right or wrong answers.

Circle the number that best describes your present agreement or disagreement with each statement.	Strongly Disagree	Disagree Somewhat	Disagree Slightly	Agree Slightly	Agree Somewhat	Strongly Agree
1. Most people see me as loving and affectionate.	1	2	3	4	5	6
2. In general, I feel I am in charge of the situation in which I live.	1	2	3	4	5	6
*3. I am not interested in activities that will expand my horizons.	1	2	3	4	5	6
4. When I look at the story of my life, I am pleased with how things have turned out.	1	2	3	4	5	6
*5. Maintaining close relationships has been difficult and frustrating for me.	1	2	3	4	5	6
6. I am not afraid to voice my opinions, even when they are in opposition to the opinions of most people.	1	2	3	4	5	6
*7. The demands of everyday life often get me down.	1	2	3	4	5	6
*8. I live life one day at a time and don't really think about the future.	1	2	3	4	5	6
9. In general, I feel confident and positive about myself.	1	2	3	4	5	6
*10. I often feel lonely because I have few close friends with whom to share my concerns.	1	2	3	4	5	6
11. My decisions are not usually influenced by what everyone else is doing.	1	2	3	4	5	6
*12. I do not fit very well with the people and the community around me.	1	2	3	4	5	6
*13. I feel like many of the people I know have gotten more out of life than I have.	1	2	3	4	5	6
14. I enjoy personal and mutual conversations with family members or friends.	1	2	3	4	5	6

Circle the number that best describes your present agreement or disagreement with each statement.	Strongly Disagree	Disagree Somewhat	Disagree Slightly	Agree Slightly	Agree Somewhat	Strongly Agree
*15. I tend to worry about what other people think of me.	1	2	3	4	5	6
16. I am quite good at managing the many responsibilities of my daily life.	1	2	3	4	5	6
17. I have a sense of direction and purpose in life.	1	2	3	4	5	6
*18. I often feel overwhelmed by my responsibilities.	1	2	3	4	5	6
19. I think it is important to have new experiences that challenge how you think about yourself and the world.	1	2	3	4	5	6
*20. My daily activities often seem trivial and unimportant to me.	1	2	3	4	5	6
21. I like most aspects of my personality.	1	2	3	4	5	6
*22. I tend to be influenced by people with strong opinions.	1	2	3	4	5	6
*23. When I think about it, I haven't really improved much as a person over the years.	1	2	3	4	5	6
*24. I don't have a good sense of what it is I'm trying to accomplish in life.	1	2	3	4	5	6
25. In many ways, I feel disappointed about my achievements in life.	1	2	3	4	5	6
26. I enjoy making plans for the future and working to make them a reality.	1	2	3	4	5	6
27. People would describe me as a giving person, willing to share my time with others.	1	2	3	4	5	6
28. I have confidence in my opinions, even if they are contrary to the general consensus.	1	2	3	4	5	6
29. I have a sense that I have developed a lot as a person over time.	1	2	3	4	5	6
*30. I have not experienced many warm and trusting relationships with others.	1	2	3	4	5	6
*31. It's difficult for me to voice my own opinions on controversial matters.	1	2	3	4	5	6

Circle the number that best describes your present agreement or disagreement with each statement.	Strongly Disagree	Disagree Somewhat	Disagree Slightly	Agree Slightly	Agree Somewhat	Strongly Agree
*32. I do not enjoy being in new situations that require me to change my old familiar ways of doing things.	1	2	3	4	5	6
33. Some people wander aimlessly through life, but I am not one of them.	1	2	3	4	5	6
*34. My attitude about myself is probably not as positive as most people feel about themselves.	1	2	3	4	5	6
35. For me, life has been a continuous process of learning, changing, and growth.	1	2	3	4	5	6
*36. I sometimes feel as if I've done all there is to do in life.	1	2	3	4	5	6
37. I know that I can trust my friends, and they know they can trust me.	1	2	3	4	5	6
*38. I have difficulty arranging my life in a way that is satisfying to me.	1	2	3	4	5	6
*39. I gave up trying to make big improvements or changes in my life a long time ago.	1	2	3	4	5	6
40. When I compare myself to friends and acquaintances, it makes me feel good about who I am.	1	2	3	4	5	6
41. I judge myself by what I think is important, not by the values of what others think is important.	1	2	3	4	5	6
42. I have been able to build a home and a lifestyle for myself that is much to my liking.	1	2	3	4	5	6

** Starred items are reverse scored.*

Appendix C:

Frequency of Contact Scale

Instructions: Indicate your response to the following statements by clicking on the number which most corresponds to your evaluation. Describe your interaction with people who are **[insert identity label]*** in each of the following contexts.

	Not at all Frequent						Extremely Frequent
1. In my family	1	2	3	4	5	6	7
2. In my intimate relations	1	2	3	4	5	6	7
3. In my neighborhood	1	2	3	4	5	6	7
4. Among my friends	1	2	3	4	5	6	7
5. Among the people with whom I have regular social contact at work or school	1	2	3	4	5	6	7
6. Among the people at the businesses I frequent	1	2	3	4	5	6	7
7. In my religious community	1	2	3	4	5	6	7

Appendix D:

Cognitive Flexibility Inventory

Instructions: Please use the scale below to indicate the extent to which you agree or disagree with the following statements.

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree
1. I am good at "sizing up" situations.	1	2	3	4	5	6	7
***2. I have a hard time making decisions when faced with difficult situations.**	1	2	3	4	5	6	7
3. I consider multiple options before making a decision.	1	2	3	4	5	6	7
***4. When I encounter difficult situations, I feel like I am losing control.**	1	2	3	4	5	6	7
5. I like to look at difficult situations from many angles.	1	2	3	4	5	6	7
6. I seek additional information not immediately available before attributing causes to behavior.	1	2	3	4	5	6	7
***7. When encountering difficult situations, I become so stressed that I cannot think of a way to resolve the situation.**	1	2	3	4	5	6	7
8. I try to think about things from another person's point of view.	1	2	3	4	5	6	7
***9. I find it troublesome that there are so many different ways to deal with difficult situations.**	1	2	3	4	5	6	7
10. I am good at putting myself in others' shoes.	1	2	3	4	5	6	7
***11. When I encounter difficult situations, I just don't know what to do.**	1	2	3	4	5	6	7
12. It is important to look at difficult situations from many angles.	1	2	3	4	5	6	7
13. When in difficult situations, I consider multiple options before deciding how to behave.	1	2	3	4	5	6	7

14. I often look at a situation from different viewpoints.	1	2	3	4	5	6	7
15. I am capable of overcoming the difficulties in life that I face.	1	2	3	4	5	6	7
16. I consider all the available facts and information when attributing causes to behavior.	1	2	3	4	5	6	7
***17. I feel I have no power to change things in difficult situations.**	1	2	3	4	5	6	7
18. When I encounter difficult situations, I stop and try to think of several ways to resolve it.	1	2	3	4	5	6	7
19. I can think of more than one way to resolve a difficult situation I'm confronted with.	1	2	3	4	5	6	7
20. I consider multiple options before responding to difficult situations.	1	2	3	4	5	6	7

** Starred items are reverse scored.*

Appendix E:

Advertisement for General Population

Cognitive and Social Determinants of Well-Being

We are interested in how social interactions and ways of thinking are related to well-being. If you are at least 18 years old and would like more information about this research study please visit

https://redcap.uky.edu/redcap/surveys/?s=TKX9M7RNM9

If you volunteer to participate, the survey will take approximately 20 minutes to complete.

If you are not eligible for this study but know someone who is, please help us by passing this information along!

The person in charge of this study is Robert Cardom, M.S, Ed.S., of University of Kentucky Department of Counseling Psychology. Robert is a doctoral candidate in counseling psychology and is being supervised in this project by Dr. Sharon Rostosky. For more information on them and their research program, please visit www.prismresearch.org.

Appendix F:

Advertisement for Participants of Color

Cognitive and Social Determinants of Well-Being

We are interested in how social interactions and ways of thinking are related to well-being, especially in People of Color (POC). If you are at least 18 years old and would like more information about this research study please visit

https://redcap.uky.edu/redcap/surveys/?s=TKX9M7RNM9

If you volunteer to participate, the survey will take approximately 20 minutes to complete.

Although we are especially interested in the experiences of People of Color, we are also accepting participants who identify as White. Please help us by passing this information along!

The person in charge of this study is Robert Cardom, M.S, Ed.S., of University of Kentucky Department of Counseling Psychology. Robert is a doctoral candidate in counseling psychology and is being supervised in this project by Dr. Sharon Rostosky. For more information on them and their research program, please visit www.prismresearch.org.

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Vita

ROBERT D. CARDOM, MS, EdS

EDUCATION

Ph.D. in Counseling Psychology, APA Accredited **(expected) May 2017**
University of Kentucky, Lexington, KY
Dissertation Title: *The Mediating Role of Cognitive Flexibility on the Relationship between Cross-Race Interactions and Psychological Well-Being.*

Committee Chair: Sharon Rostosky, PhD

Ed.S. in Counseling Psychology **May 2014**
University of Kentucky, Lexington, KY

M.S. in Counseling Psychology **December 2012**
University of Kentucky, Lexington, KY

B.A. in Psychology (Magna Cum Laude) **May 2010**
Georgia State University, Atlanta, GA
Minor in Social Work

AWARDS

Robert and Freda Carlin Unsung Hero Award, Recipient **April 2014**
Division of Student Affairs
University of Kentucky
$300 Award

Graduate Assistant of the Year, Nominee **April 2013**
Division of Student Affairs
University of Kentucky

CLINICAL EXPERIENCE

Counseling Intern **January 2015 – Present**
Transylvania University Counseling Services, Lexington, KY Intervention Hours: 124
Site Supervisor: Georgeann Brown, PhD Supervision Hours: 41
Faculty Supervisor: Daniel Walinsky, PhD, Danelle Stevens-Watkins, PhD

Practicum Counselor **August 2014 – December 2014**
Graham Office of Career Management, Lexington, KY Intervention Hours: 68
Site Supervisor: Sally Foster, MA, NCC, MCC Supervision Hours: 30
Faculty Supervisor: Danelle Stevens-Watkins, PhD

Practicum Counselor **August 2013 – May 2014**
Gay and Lesbian Service Organization, Lexington, KY Intervention Hours: 176
Site Supervisor: Mendy Daniels, MSW, LCSW Supervision Hours: 103
Faculty Supervisor: Danelle Stevens-Watkins, PhD; Jeff Reese, PhD

Group Facilitator and Advisor **February 2012 - Present**
Gay and Lesbian Service Organization, Lexington, KY
- Led support group sessions for LGBT adolescents

Practicum Counselor **August 2012 – May 2013**
University of Kentucky Counseling Center, Lexington, KY Intervention Hours: 134
Site Supervisors: Nathaniel Hopkins, PhD; Diane Sobel, PhD; Supervision Hours: 181
Tina Bryant, PhD; Susan Matthews, PhD
Faculty Supervisor: Pam Remer, PhD; Kiesha Love, PhD

Group Facilitator **February 2010 – August 2011**
YouthPride, Inc., Atlanta, GA
- Led psychoeducational group sessions for gay adolescent and young adult men

PUBLICATIONS

Butina, M., Wyant, A., Remer, R., & **Cardom, R.** (in review). Early predictors of students at risk of poor PANCE performance. *Journal of Physician Assistant Education.*

Cardom, R., Rostosky, S., & Danner, F. (2013). Does "it get better" for depressed sexual minority youth in young adulthood? *Journal Of Adolescent Health, 53*, 671-673. doi:10.1016/j.jadohealth.2013.07.023

Gonzalez, K., Rostosky, S., **Odom, R.**, & Riggle, E. (2013). The positive aspects of being the parent of an LGBTQ child. *Family Process, 52*, 325-337. doi:10.1111/famp.1200

NATIONAL PEER-REVIEWED PRESENTATIONS

Butina, M., Wyant, A., Remer, R., & **Cardom, R**. (2015, November). *An early prediction model for PANCE success*. Paper presented at the annual meeting of the Physician Assistant Education Association, Washington, DC.

Cardom, R., Ryser-Oatman, T., Rostosky, S., & Riggle, E. (2015, August). *Positive LGB identity protects against minority stress*. Poster presented at the annual meeting of the American Psychological Association, Toronto, ON.

Odom, R., Rostosky, S. & Danner, F. (2012, August) *Does it get better? LGB depression and suicidality from adolescence to adulthood*. Paper presented at the biennial meeting of the Add Health Users Conference, Bethesda, MD.

Odom, R., Danner, F., Black, W. & Rostosky, S. (2012, August). *Does "It get better" for LGB youth in young adulthood?* Poster presented at the annual meeting of the American Psychological Association, Orlando, FL.

Gonzalez, K., **Odom, R.**, Rostosky, S. & Riggle, E. (2012, August). *I have learned so much: The positive aspects of being the parent of an LGBT child.* Poster presented at the annual meeting of the American Psychological Association, Orlando, FL.

Pascale-Hague, D. Black, W., McCants, W., **Odom, R.**, Gonzalez, K., Aaron, A. & Russell, G. (2012, August). *Developing LGBT allies: ongoing research and intervention.* Roundtable discussion presented at the annual meeting of the American Psychological Association, Orlando, FL.

Odom, R., & Parrott, D. (2011, November). *Demonstrating masculinity via antigay aggression: The moderating effect of acute alcohol intoxication.* Poster presented at the annual meeting of the Association for Behavior and Cognitive Therapies, Toronto, ON.

Odom, R., Rzajeva, O., & *Parrott*, D. (2011, June). *Alcohol intoxication and aggression against women: The moderating role of male role norms.* Poster presented at the annual meeting of the Research Society on Alcoholism, Atlanta, GA.

Odom, R. & Parrott, D. (2010, April). *The mediating role of male role norms in the association between authoritarianism and attitudes toward lesbians and gay men*. Poster presented at the annual meeting of the Georgia State Undergraduate Research Conference, Atlanta, GA.

PROFESSIONAL PRESENTATIONS

Cardom, R. (2015, August). *Inclusive workplace relationships*. Professional development seminar presented to annual employee training of the Davies County School System, Owensburo, KY.

Cardom, R. & Bennington, J (2015, March). *Inclusive curriculum and school environments*. Professional development seminar presented at the class meeting of the Bellarmine University Masters in Education Program, Louisville, KY.

Cardom, R. & Bennington, J (2014, August). *Inclusive curriculum and school environments*. A professional development seminar presented at the annual employee training of the Fayette County Public School System, Lexington, KY.

Cardom, R. & Robinson, R. (2014, August) *Identity and loaded words.* Training presented to the annual University of Kentucky UK 101 course instructor training, Lexington, KY.

Cardom, R. & Robinson, R. (2013, June) *Breaking through the web of oppression*. Training presented to the annual meeting of the Junior MANRRS, Lexington, KY.

Cardom, R. & Robinson, R. (2013, August-November) *Identity and loaded words.* Trainings presented to 15 sections of the University of Kentucky UK 101 course, Lexington, KY.

Cardom, R. & Rhodes, M. (2013, October) *Ally weekend.* Workshops presented to the annual meeting of Ally Weekend, Lexington, KY.

Slaymaker, K., **Odom, R.**, & Bengu, E. (2013, March). *Cross cultural workshop*. Workshops presented to the annual meeting of the University of Kentucky Cross Cultural Workshop, Lexington, KY.

Slaymaker, K., **Odom, R.**, Brownell, H., & Comage, R. (2012, October). *Cross cultural workshop*. Workshops presented to the annual meeting of the University of Kentucky Cross Cultural Workshop, Lexington, KY.

Odom, R. & Comage, R. (2012, October) *Ally weekend.* Workshops presented to the annual meeting of Ally Weekend, Lexington, KY.

Odom, R., Gonzalez, K., Black, W., Kodet, J., Mason, D., Li, M., Morrow, M. (2012, August). *Ally development workshop.* Workshop presented to the annual University of Kentucky College of Education's Ally Development Workshop, Lexington, KY.

Slaymaker, K., **Odom, R.**, Brownell, H., & Bengu, E. (2012, March). *Cross cultural workshop*. Workshops presented to the annual meeting of the University of Kentucky Cross Cultural Workshop, Lexington, KY.

Odom, R., & Abell, A. (2012, March). *Occupy campus: Part of the plan in action series.* Discussion presented to the University of Kentucky's Office of Diversity Education, Lexington, KY.

Singh, A., **Odom, R.**, & McNulty, J. (2011, August). *Acting proactively to prevent LGBTQ related bullying in schools and support positive LGBTQ youth development.* Panel discussion session presented at the annual meeting of the University of Georgia Diversity and Counseling Conference, Lawrenceville, GA.

PROFESSIONAL AND COMMUNITY ENGAGEMENT

Graduate Assistant for Diversity Education **Fall 2015 – Present**
Office of Student Involvement – University of Kentucky, Lexington, KY
Supervisor: Rhonda Strouse

Research Assistant **Fall 2014 – Summer 2015**
College of Health Sciences – University of Kentucky, Lexington, KY
Supervisor: Randa Remer, PhD

Board Member **Spring 2014 – Summer 2015**
Gay Lesbian Straight Education Network (GLSEN), Bluegrass Chapter, Lexington, KY

Graduate Assistant for Diversity Education **Fall 2011 – Summer 2014**
Office of Student Involvement – University of Kentucky, Lexington, KY
Supervisor: Rebecca Comage; Tori Amason; Rosalyn Robinson

LGBT Task Force Member **August 2011 – August 2014**
University of Kentucky, Lexington, KY

Activities Co-chair, Lexington Pride Committee **July 2012 – July 2013**
Gay and Lesbian Service Organization, Lexington, KY

Volunteer Coordinator **July 2010 – July 2011**
YouthPride, Inc., Atlanta, GA

Center host **June 2009 – June 2010**
YouthPride, Inc., Atlanta, GA

Student Assistant **August 2007 – May 2008**
Office of Disability Services – Georgia State University, Atlanta, GA

RESEARCH EXPERIENCE

Lab Member **August 2011 – Present**
Psychosocial Research Initiative for Sexual Minorities Lab, University of Kentucky, Lexington, KY
Supervisor: Sharon Rostosky, PhD

Lab Coordinator **July 2010 – August 2011**
Behavioral Sciences Laboratory, Georgia State University, Atlanta, GA
Supervisor: Dominic Parrott, PhD

Lab Assistant **February 2008 – June 2010**
Behavioral Sciences Laboratory, Georgia State University, Atlanta, GA
Supervisor: Dominic Parrott, PhD

PROFESSIONAL SERVICE

Archives of Sexual Behavior **2014 – Present**
Ad Hoc Reviewer
Mentor: Sharon Rostosky, PhD

Journal of Adolescent Health **2014 – Present**
Ad Hoc Reviewer
Mentor: Sharon Rostosky, PhD

Suicide and Life-Threatening Behavior **2013 – Present**
Ad Hoc Reviewer
Mentor: Sharon Rostosky, PhD

PROFESSIONAL MEMBERSHIPS

American Psychological Association, Student Affiliate.

APA Division 17: Society of Counseling Psychology, Student Affiliate.

APA Division 44: Lesbian, Gay, Bisexual, and Transgender Issues, Student Affiliate.